CONTRIBUTION OF PETROLEUM INDUSTRY IN INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION: A COMPARATIVE STUDY OF MATHURA REFINERY AND JAMNAGAR REFINERY

A

SYNOPSIS

SUBMITTED IN THE PARTIAL FULFILMENT FOR THE REQUIREMENT

OF

DOCTOR IN PHILOSOPHY

IN

APPLIED BUSINESS ECONOMICS

SUBMITTED BY

PRINCE

UNDER THE SUPERVISION OF

DR. ANISHA SATSANGI

DEPARTMENT OF APPLIED BUSINESS ECONOMICS, FACULTY OF COMMERCE

DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED TO BE UNIVERSITY)

DAYALBAGH, AGRA-282005

2021

1.0 INTRODUCTION

Sustainable Development Goal-9 is built on three pillars, infrastructure, industry and innovation, all of which are strongly connected among themselves and share the common goal of achieving socially inclusive and environmentally sustainable economic development. Over the past decades regions such as East and South Asia have made significant progress in achieving development goals in the areas of infrastructure, industrialization and innovation. Achieving Goal 9 by 2030 will require addressing a range of resource constraints, especially in the context of developing countries vulnerable countries including the least developed countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS). Countries will have to strengthen their capabilities and explore new ways to solve development challenges by involving various actors, processes and types of governance, source of finance and encourage collaboration and cooperation across stakeholders, sectors and regions.

Inclusive and sustainable industrial development (ISID) is the primary source of income generation, allows for rapid and sustained increases in living standards for all people, and provides the technological solutions to environmentally sound industrialization. Technological progress is the foundation of efforts to achieve environmental objectives, such as increased resource and energy-efficiency. Without technology and innovation, industrialization will not happen, and without industrialization, development will not happen. Inclusive in this context means the industrial development must include all countries and all peoples, as well as the Private Sector, civil society organizations multinational development institutions, and all parts of the UN system and offer equal opportunities and an equitable distribution of the benefits of industrialization to all stakeholders. The term Sustainable addresses the need to decouple the prosperity generated from industrial activities from excessive natural resource use and negative environmental impact. Inclusive and Sustainable Industrial Development (ISID) therefore implies that no one is left behind and all parts of society benefit from industrial Progress, which also provides the means for tackling critical social and humanitarian needs.

The Countries that have succeeded in achieving sustained economic growth and development are those that have been able to transform their Production activities effectively from low to high

Productivity and to; diversify from the Production and export of a single or a few Primary Products to the manufacture and export of finished products. The need to industrialize remains for many poor countries as they try to catch up with more advanced economies and to improve living standards and outstanding challenge.

1.1 History of Petroleum Industry

Colonel Edwin Drake drilled the first successful oil well in Titusville, Pennsylvania in 1859. Drake and his backers were looking for a source of kerosene to be used for lighting fuel. For most of the 19th century, gasoline was merely a by-product of the production of kerosene, with few commercial uses. The remarkable transformation in mobility of people and goods began only after the beginning of the new century.

The primary market for oil had begun to disappear when Thomas Edison invented the light bulb and created the electrical generation industry. In 1882, Edison threw a switch to start the first commercial electrical generating plant and, by the turn of the century, there were over 18 million light bulbs in use in the U.S. alone. The oil industry lost its major market.

The invention of the automobile changed all that. At the beginning of 20th century there were about 8,000 registered vehicles, and by 1920 there were 23 million cars. However, it was not clear whether gasoline engines would be used to fuel the automobile. Early models were powered by steam and electricity as well as gasoline; in the early 1900s most were electric. Yet, gasoline-powered engines turned out to be the most practical design because battery-powered engines did not have sufficient range. With the construction of a network of gasoline filling stations, the infrastructure was put in place to ensure a consistent supply of fuel. Therefore, gasoline-powered automobiles captured the market. World War I irrevocably changed the role of petroleum in the world. When the war began, military planning focused on the horse as the primary mode of transportation. It assumed that one horse was needed for every three soldiers, which provided a logistical problem since the horses required ten times as much food. When Britain entered the war, it had only about 800 motor vehicles, most of which were requisitioned from private citizens.

By the end of the war, Britain had 56,000 trucks and 36,000 cars. In addition, the U.S. shipped over 50,000 vehicles to Europe and, in one and a half years, built 15,000 planes. Motorized transport began

to dramatically change the nature of war. The development of the airplane and the tank, which was first used at the Battle of the Somme in 1918, provided both mobility and power that was unprecedented in the history of warfare.

Oil began to provide a critical advantage that changed how nations regarded this natural resource. Previously, oil was seen as a commodity brought to market by a few entrepreneurs; after WWI, it was regarded as a strategic mineral for which supplies had to be ensured. During the war, Britain had converted their ships from coal-burning to oil-powered to give them increased speed and mobility. During this same time, Germany's submarine attacks in the Atlantic cut off Britain's oil shipments and nearly brought defeat.

After the war, one of the priorities of both Britain and France was to ensure their access to oil, particularly in Mesopotamia, where oil had been discovered in 1908. Division of spheres of interest in that region were heavily influenced by the potential of oil within the region. However, until the 1940s, the United States was the world's leader in oil production, producing 65 percent of the world's oil. In 1940, the Middle East accounted for less than 5 percent of total production.

This changed dramatically with the discovery of "supergiant" oil fields in Kuwait and Saudi Arabia in the 1930s and 1940s. Throughout the world, a growing reliance on Middle East oil became a serious concern. In the U.S., it was due to the oil shocks of the 1970s. The first shock occurred in 1973 after Egypt and Syria attacked Israel. The U.S. had furnished arms to Israel and the Middle Eastern countries responded by imposing an oil embargo on the U.S., which led to long lines at gasoline stations. The U.S., led by President Gerald Ford, launched a national effort to reduce dependence on Middle Eastern oil through "Project Independence," a ten-year plan to build 150 coal-fired power plants and 200 nuclear plants, in addition to building synfuel plants. This project was meant to ensure that the U.S. had a domestic supply of critical energy supplies; however, after the oil shortages subsided, so did much of the interest in the new initiatives.

The second oil shock occurred during 1978-1979 after the fall of Iran. Panic buying drove up prices and depleted supplies, resulting once again in long lines at gasoline stations. The Carter administration responded by introducing a national program to develop synfuels. Unfortunately, the oil shocks were soon replaced by an oil glut during the 1980s. The return of cheap oil meant that the new initiatives,

including the development of synfuels and alternative energy technologies, were largely abandoned because they would not be able to compete against the cheap petroleum-based technologies.

The first oil deposits in India were discovered in 1889 near the town of Digboi in the state of Assam. The natural gas industry in India began in the 1960s with the discovery of gas fields in Assam and Gujarat. Natural gas gained further significance after the discovery of large reserves in the South Basin fields by ONGC in the 1970s.

1.2 Role of Petroleum Industry in Industrialization

The petroleum industry, also known as the oil industry or the oil patch, includes the global processes of exploration, extraction, refining, transporting (often by oil tankers and pipelines), and marketing of petroleum products. The largest volume products of the industry are fuel oil and gasoline (petrol). Petroleum (oil) is also the raw material for many chemical products, including pharmaceuticals, solvents, fertilizers, pesticides, synthetic fragrances, and plastics. The extreme monetary value of oil and its products has led to it being known as "black gold". The industry is usually divided into three major components: upstream, midstream, and downstream, Upstream deals with Drilling and Production mainly, midstream includes pipelines and the entire infrastructure needed to move these resources long distances, such as pumping stations, tank trucks, rail tank cars and transcontinental tankers and Downstream includes everything involved in turning crude oil and natural gas into thousands of finished products we depend on every day.

Petroleum is vital to many industries, and is necessary for the maintenance of industrial civilization in its current configuration, making it a critical concern for many nations. Oil accounts for a large percentage of the world’s energy consumption, ranging from a low of 32% for Europe and Asia, to a high of 53% for the Middle East.

Other geographic regions' consumption patterns are as follows: South and Central America (44%), Africa (41%), and North America (40%). The world consumes 30 billion barrels (4.8 km^3) of oil per year, with developed nations being the largest consumers. The United States consumed 25% of the oil produced in 2007.The production, distribution, refining, and retailing of petroleum taken as a whole represents the world's largest industry in terms of dollar value.

In recent years, enhanced oil recovery techniques — most notably multi-stage drilling and hydraulic fracturing ("fracking") — have moved to the forefront of the industry as this new technology plays a crucial and controversial role in new methods of oil extraction.

India's current refining capacity stands at 249 MMTPA, comprising of 23 refineries—18 under public sector, 3 under private sector and 2 in a joint venture. Indian Oil Corporation (IOC) is the largest domestic refiner with a capacity of 80.7 MMTPA. Top three companies – IOC, Bharat Petroleum Corporation (BPCL) and Reliance Industries (RIL) - contribute around 66.7% of India's total refining production from FY 2018 - 19. At present about 16,788 km natural gas pipeline is operational and about 12,672 km gas pipelines are under development.

India has witnessed a steady increase in production as well as consumption of petroleum products over the years. The production of petroleum products stood at 243.5 MMT during 2016-17 to 262.3 MMT in 2018-19. India was the fourth-largest Liquefied Natural Gas (LNG) importer in 2017 after Japan, South Korea and China. LNG imports increased to 26.11 bcm in 2017-18 from 24.48 bcm in 2016-17. Liquefied Natural Gas (LNG) supply is forging ahead on both coasts, with 8 new R-LNG terminals (4 on the west and 4 on the east coast) coming up. Together with the six existing terminals, overall capacity will reach 74 MMTPA.

India’s domestic crude oil production in July 2019 is 2,769 thousand tonne (TMT). As of 2017, the country had 600 million metric tonnes (MMT) of proven oil reserves. In FY19, total crude oil imports were valued at US$ 111.96 billion as compared to US$ 87.70 billion in FY18. In FY19, crude oil imports increased to 4.53 mbpd from 4.41 mbpd in FY18. Production of petroleum products by fractionators grew to 4,931.22 tmt in FY19 from 4,808.00 tmt in FY18 and reached 2369 TMT in FY20 (till September 2019).

1.3 Role of Petroleum Sector In Indian Economy

The development of the Indian petroleum industry began on a very slow note. It started mainly in the north-eastern part of India especially in the place called Digboi in the state of Assam. Until the 1970’s, the production of petroleum and the exploration of new locations for extraction of petroleum were mainly restricted to the north-eastern state in India.

However, an important advancement in the Indian petroleum industry came with the passing of Industrial Policy Resolution in 1956, which emphasized focus on the growth and promotion of industries in India. Another major incident was the discovery of Bombay High, which changed the scenario of the Indian petroleum industry drastically. The Indian petroleum industry was sponsored completely by the government, and the management control of the petroleum industry and all its related activity was entirely with the government. The petroleum industry has the most significant role to play in changing the Indian economy from an agrarian economy to an industrial economy. The adoption of liberalization and privatization in July 1991 changed the situation again. The government started allowing the Indian petroleum industry to go into private hands and also entered into government and private joint ventures. The government also eased the stringent regulation process on the petroleum industry. This gave a tremendous boost to the petroleum industry in India. The industry began to grow at a tremendous pace. The production of petroleum and petroleum products also showed a significant rise. Along with liberalization and privatization, the overall economy of India grew. The oil and gas sector is among the eight core industries in India and plays a major role in influencing decision making for all the other important sections of the economy. The demand for petroleum products increased at an annual rate of about 5.5%. The demand for petroleum and petroleum products still continues to grow, and there is great potential for investors to invest in the sector and gain valuable returns while meeting the increasing demands for the petroleum products. India's economic growth is closely related to energy demand; therefore the need for oil and gas is projected to grow more, thereby making the sector quite conducive for investment. The Government of India has adopted several policies to fulfil the increasing demand. The petroleum industry in India is particularly favourable for foreign investment because the industry is one of the fastest growing segments, and it has shown a staggering growth rate of around 13% in the recent past. The government has allowed 100 per cent Foreign Direct Investment (FDI) in many segments of the sector, including natural gas, petroleum products, and refineries, among others. Today, it attracts both domestic and foreign investment, as attested by the presence of Reliance Industries Ltd (RIL) and Cairn India. India had 4.5 thousand million barrels of proven oil reserves at the end of 2018 and produced 39.5 million tonnes in 2018. As of Apr 01, 2019, India had a network of 10,419 km of crude pipeline having a

capacity of 145.6 mmtpa. Apart from the tremendous growth rate in the Indian petroleum industry today, it also boasts technology of international standards, easy availability of infrastructure at very cheap rates, high demands for petroleum products, and increased spending habits of the middle-class people. All these factors make investments in the Indian petroleum industry an attractive proposition for foreign investors. The foreign trade in petroleum and petroleum products in the recent past have registered significant growth. It has thus attracted new foreign investments. Some of the main petroleum products that are manufactured for trade with foreign countries are petroleum gases, gas oil, propane, distilled crude oil, naphtha, ethane, and kerosene.

The petroleum industry has contributed heavily to the manufacturing industry in the country through foreign trade in petroleum products. Rapid globalization, fast-changing technology, and the changing methods in the way business is conducted have brought significant changes and enormous opportunities for petroleum companies in India to flourish and expand their operation to global markets.

Another very important reason why the Indian petroleum industry is a good option for investment is that the future of the petroleum industry in India promises great potential for development. The fast economic growth of India and the various developmental activities taking place presents India with opportunities in the future to be a dominant player globally in the export of petroleum products.

1.4 Major Indian Companies in Petroleum Sector

1. Indian Oil Corporation
2. Bharat Petroleum
3. Oil and Natural Gas Corporation
4. Gail India Limited
5. Reliance Petroleum
6. Hindustan Petroleum
7. Oil India
8. Cairn India
9. TATA Petrodyne Limited
10. Nayara Energy (Essar Oil)

1.5 MATHURA REFINERY (INDIAN OIL CORPORATION LIMITED)

Mathura Refinery, the sixth refinery of Indian Oil was commissioned in 1982 with a capacity of 6.0 MMTPA to meet the demand of petroleum products in north western region of the country, which includes National Capital Region. Refinery is located along the Delhi-Agra National Highway about 154 KM away from Delhi. The major secondary processing units provided were Fluidised Catalytic Cracking Unit (FCCU), Vis-breaker Unit (VBU) and Bitumen Blowing Unit (BBU). A Diesel Hydro Desulphurisation Unit (DHDS) licensed from Axens, France was commissioned in 1999 for production of HSD with low Sulphur content of 0.25% wt (max). With the commissioning of once through Hydrocracker Unit (licensed from Chevron, USA) in July 2000, capacity of Mathura Refinery was increased to 8.0 MMTPA. Mathura is having its own captive power plant, which was augmented with the commissioning of three Gas Turbines (GT) and Heat Recovery Steam Generator (HRSG) in phases from 1997 to 2005 using Natural Gas (NG) as fuel to take care of environment.

For upgrading environmental standards, old Sulphur Recovery Units (SRU) was replaced with new Sulphur Recovery Units with 99.9 % recovery in the year 1999. Additional Sulphur Recovery Unit is under implementation as a hot standby. Mathura Refinery had also set up four nos. of continuous Ambient Air Monitoring Stations far beyond the working area before commissioning of the Refinery in 1982 as a mark of its concern towards the environment and archaeological sites. Its close proximity to the magnificent wonder Taj Mahal adds extra responsibility towards maintaining a cleaner environment.

Mathura Refinery has planted 1, 67,000 trees in surrounding areas including refinery & township and 1, 15,000 trees in Agra region around Taj Mahal. The Ecological Park which is spread across 4.45 acres is a thriving green oasis in the heart of sprawling Refinery.

At Mathura Refinery, technology & ecology go hand in hand with continuous endeavour for Product Quality up-gradation, Energy Conservation and Environment Protection. Mathura Refinery is the first in Asia and third in the world to receive the coveted ISO-14001 certification for Environment Management System in 1996. It is also the first in the World to get OHSMS certification for Safety Management in 1998 and 50001 Certification for Environment Management System in 2018.

With the incoming of modern technologies, Mathura Refinery witnessed progression in its production capacity and keeping pace with the new Government policies of clean fuels; it became the pioneer in production and supply of Bharat Standard VI MS and HSD to Delhi/ NCR. Although, the refinery had produced BS VI fuel in 2016 and given some barrels to Honda and Mahindra- the auto giants for their engine testing purposes, the full-fledged supply of these clean fuels started from January 2018.

Mathura Refinery has followed the vision of Prime Minister Narendra Modi towards "Make in India" and has commissioned a new Unit OCTAMAX, the breakthrough technology developed by IOC's R&D Centre that converts C-4 streams from Catalytic Cracker unit to high-octane gasoline (petrol) blending stream, thereby enabling compliance with stringent fuel quality norms.

Other future endeavours that underline the Refinery's commitment towards the environment include conservation of Yamuna river ecology. As part of this, Mathura Refinery recently entered into an agreement with the National Mission for Clean Ganga for using treated effluent (20 MLD) from a proposed Sewage Treatment Plant in Mathura - Vrindavan area, instead of fresh river water, for refinery operations in the next two years. Thus, from 2020-21, Mathura Refinery will stop drawing fresh water for industrial use from raw water sources and will instead use treated sewage water.

1.6 JAMNAGAR REFINERY, RELIANCE PETROLEUM LIMITED

The Jamnagar Refinery is a private sector crude oil refinery owned by Reliance Industries Limited in Jamnagar, Gujarat, India. The refinery was commissioned on 14 July 1999 with an installed capacity of 668,000 barrels per day (106,200 m3/d). It is currently the largest refinery in the world. The entire refining complex was built in a record time at globally competitive capital costs – in fact, at costs much lower than comparable refineries around the world. Its scale, design, flexibility, level of automation and degree of integration heralded the way refineries of the future would be built. It has transformed India from being a net importer of petroleum products to a net exporter, thereby ensuring the nation's energy security.

With crude processing capacity of 1.24 million Barrels Per Stream Day (BPSD), the Jamnagar refinery is a trendsetter and has won several awards, including the prestigious 'International Refiner Of The Year' award. Fuels from Jamnagar refinery are exported to several countries across the world. This complex refinery is future ready and can produce gasoline and diesel of any grade. The current

capacity of Jamnagar refinery (Domestic Tariff Area) is 33 MMTPA that caters to fuel requirements within the country. Reliance also has another refinery the sixth largest in the world in the Special Economic Zone at Jamnagar only-for-exports with 35.2 million tonne unit. This refinery has a capacity for processing 580,000 BPD of crude.

1.7 Petroleum Products

Jamnagar Refinery	**Mathura Refinery**
• Liquefied Petroleum Gas (LPG) • Propylene • Naphtha • Gasoline • Jet /Aviation Turbine Fuel • Superior Kerosene Oil • High-Speed Diesel • Sulphur • Petroleum Coke	• Gasoline • Diesel • Liquefied Petroleum Gas (LPG) • Bitumen

2.0 REVIEW OF LITERATURE

S.NO	**Author**	**Paper Title and Publication Details**	**Year**	**Objective**	**Research Methodology**	**Findings**
1.	Divya Tripathi, Pushpendra Priyadar shi, Pankaj Kumar, Sushil Kumar	"Micro-foundations for sustainable development: leadership and employee performance" International Journal of Organizational Analysis ISSN: 1934-8835	2020	The purpose of this paper is to take a micro-foundational perspective to identify the effective leadership style and employee work behaviour in achieving the goals of sustainability. It also aims to identify the mechanism through which leaders influence employees' performance.	The study draws on existing literature for model creation and proposition development to understand the leadership style and employee behaviour that would be effective in achieving sustainability goals.	It concludes that servant leadership style is effective in mobilizing the resources and implementing the sustainability strategies among stakeholders. By enhancing interpersonal trust and psychological empowerment, servant leaders positively influence the work role behaviour of the employees. Furthermore, the work performance of

						employees helps in achieving sustainable development.
2.	Maitreyee Das, K. Rangarajan, Gautam Dutta	"Corporate sustainability in SMEs: an Asian perspective" Journal of Asia Business Studies ISSN: 1558-7894	2020	The purpose of this paper is to do a thorough literature review to assess the current status of corporate sustainability (CS) practices, issues and challenges in small and medium enterprises (SMEs).	The authors did a high level literature review to estimate the gap area and based on the findings formulated some research questions on why the SMEs, more specifically those in Asian emerging market, are lagging behind in terms of CS practices. Next, using the "literature survey" as the methodology the authors did a thorough in-depth literature review to answer the above research questions and organised the findings in light of those research questions. Considering the research gap and the crucial role of SMEs in a country's economic progress the authors restricted the literature search on CS in the case of SMEs only.	CS is a well-practiced area in big organisations. However, the literature suggests that in the case of SMEs the situation is different. Social and environmental practices are grossly neglected in SMEs more specifically in emerging markets. Existing literature mentions that collaborative mode of operation; government policy and facilitation, supporting organisation culture can positively influence SME's sustainability performance, and hence, improve their financial performance.
3.	Luisa Huaccho	"The quest for achieving	2019	To draw knowledge	This paper is based on	One of the challenges that

	Huatuco, Peter D. Ball	United Nations sustainability development goals (SDGs): Infrastructure and innovation for responsible production and consumption" RAUSP Management Journal ISSN: 2531-0488		from different disciplines to tackle some of the complexities of achieving SDGs.	descriptive analysis. It tries to clear theoretical aspects of SDG in infrastructure and innovation.	is recognised for industry is the complex nature of problems and opportunities and hence the need for collaboration. It is recognised that common, open source toolboxes are needed to support change of practice. Such toolboxes need to span all business disciplines and be supported by a common language. Production will develop and spread more readily (IET, 2017). It is estimated that by 2050, the world will need around 60 per cent more food to cope with the increased demand from the projected population of 9bn.
4.	Anuj Singla, Inderpreet Singh Ahuja, Amanpreet Singh Sethi	"An examination of effectiveness of technology push strategies for achieving sustainable development in manufacturing industries" Journal of Science and Technology Policy	2019	The purpose of this study is to estimate and extract various significant technology push (TP) strategies influencing sustainable development in Indian manufacturing industries.	An extensive survey of 92 companies has been executed to identify improvements made by TP strategies to achieve sustainable development in manufacturing industries. The companies in the survey	The research concludes that two TP strategies, namely, corporate strategy and innovative capability, are found to be substantial in the present context. These strategies have emerged as a

		Management ISSN: 2053-4620			include medium− and large−scale manufacturing enterprises. The correlations between various TP strategies and sustainable development indicators are evaluated and validated using various numerical methods and tools.	foundation for several development initiatives and actively support manufacturing industries in accomplishing sustainable development. however, enterprises need to work more actively on improving less significant issues of TP.
5.	Jan Bebbington, Jeffrey Unerman	"Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research" Accounting, Auditing & Accountability Journal ISSN: 0951-3574	2018	The purpose of this paper is to establish and advance the role of academic accounting in the pursuit of the United Nations Sustainable Development Goals (SDGs).	This paper provides a synthesis of interdisciplinary perspectives on sustainable development and integration of this with the accounting for sustainability literature. In addition, potential accounting research contributions are proposed so as to support the development of new research avenues.	Existing research serves as an initial link between them and the accounting discipline. At the same time, the SDGs focus highlights new sites for empirical work (including interdisciplinary investigations) as well as inviting innovation in accounting theoretical frameworks. Moreover, the SDGs provide a context for (re)invigorating accounting's contribution to sustainable development debates.
6.	Anuj Singla, Inderpreet Singh Ahuja, APS Sethi	"Technology push and demand pull practices for achieving	2018	The purpose of this paper is to evaluate the significance	An extensive survey of 92 companies in India has been executed to	The focus of the paper is on the distinguishable contributions

		sustainable development in manufacturing industries" Journal of Manufacturing Technology Management ISSN: 1741-038X		of various technology push (TP) and demand pull (DP) practices substantial for achieving sustainable development in Indian manufacturing industries.	identify improvements made by TP-DP practices, to achieve sustainable development in manufacturing industries. The companies in the survey include medium- and large-scale manufacturing enterprises. The correlations between various TP-DP practices and sustainable development parameters are evaluated and validated using various numerical methods and tools.	made by TP-DP. The inter-relationships between different TP-DP practices with sustainable development parameters are evaluated to effectively manage the goals and objectives of industries related to sustainability and growth. However, it is also acknowledged that manufacturing firms need to work more actively on managing certain practices of TP-DP.
7.	Surajit Bag, Shivam Gupta, Arnesh Telukdarie	"Importance of innovation and flexibility in configuring supply network sustainability" Benchmarking: An International Journal ISSN: 1463-5771	2018	The purpose of this paper is to scientifically examine the influence of organization culture (OC), green supplier development (GSD), supplier relationship management, flexibility and innovation on sustainability in supply network (SSN) under the moderation effect of institutional	The study is grounded by integrating institutional theory (IT) and resource-based view (RBV) theory. The study empirically tests the conceptual model through survey data gathered from 175 respondents in the KwaZulu-Natal province of Southern Africa using structural equation modelling which is a multivariate data analysis	It was found that OC plays a crucial role in shaping the workforce behaviour and responsible for enhancing GSDs and building good relationship with suppliers which ultimately results into increased flexibility and innovativeness. Coercive pressures (CPs) play a moderating role between the causal

				pressures and resources availability.	technique that permits to simultaneously examine many relationships among manifest and latent variables.	relationship of innovation and SSN. Therefore, CPs have got the ability to amplify or reverse the effect between innovation and SSNs.
8.	Sumit Gupta, G.S. Dangayach, A.K. Singh, M.L. Meena, P.N. Rao	"Implementation of sustainable manufacturing practices in Indian manufacturing companies" Benchmarking: An International Journal ISSN: 1463-5771	2018	The purpose of this paper is to assess the sustainable manufacturing practice (SMP) in Indian manufacturing sector. This paper is also focused on the how lean practice leads to the sustainable manufacturing (SM).	A survey methodology is used for this research. The SMPs are identified for the literature review and survey questionnaire was framed. In all, 345 usable responses from four sectors namely automobile, electrical and electronics, machinery and process were collected through Google survey.	This research is focused on the SMPs. From this research it is found that sustainable product and process design (SPPD), lean practices (LP), agile practice and customization, sustainable supply operation and distribution and product recovery and return practices lead to the SM.
9.	Shampy Kamboj, Zillur Rahman	"Market orientation, marketing capabilities and sustainable innovation: The mediating role of sustainable consumption and competitive advantage" Management Research Review ISSN: 2040-8269	2017	This study aims to observe the association between market orientation (MO), marketing capabilities and sustainable innovation and to determine the contributions of marketing capabilities, sustainable consumption and competitive	The data for this study were collected by administering a survey, and well-defined scales were used for quantifying the data. Theories propounded by various authors were used to form the theoretical framework of the study while keeping those theories relevant to the Indian context. The study uses	The results indicated that MO has a positive influence on marketing capabilities, including product development, communication, channel linking and pricing. The study also found, albeit with exceptions, a positive association between marketing

				advantage as mediators.	structural equation modelling to empirically test proposed hypothesis and research model of the relationships.	capabilities and sustainable innovation. In addition, findings reveal that marketing capabilities fully mediate MO to performance link while sustainable consumption partially mediates the relation between sustainable innovation and competitive advantage. Competitive advantage also partially mediates marketing capabilities to performance relationship.
10.	Nilesh Agarchand, Boeing Laishram	"Sustainable infrastructure development challenges through PPP procurement process: Indian perspective" International Journal of Managing Projects in Business ISSN: 1753-8378	2017	The purpose of this paper is, therefore, to identify the shortcomings in the Indian PPP procurement process using the key principles of sustainability.	Qualitative research inquiry through grounded theory approach by using the literature and interview source was used. These challenges were, first, reviewed from the perspectives of key sustainability principles and then discussed with the key stakeholders through focused interviews. Furthermore, micro-interlocutor analysis was carried to get an	The key shortfalls identified from the study that adversely affect progress toward sustainable development include incomprehensi ve environmental impact assessment and social impact assessment studies; lack of stakeholder and local participation; high bidding and transaction cost; high user charges; improper risk

					insight on the extent of consensus amongst the experts regarding these identified shortfalls.	allocation; lack of transparency and accountability; goal conflicts between public and private sector; and lack of skill and knowledge about sustainability.
11.	Nilesh Agarchand Patil, Boeing Singh Laishram	"Sustainability of Indian PPP procurement process: Development of strategies for enhancement" Built Environment Project and Asset Management ISSN: 2044-124X	2016	The purpose of this paper is to develop a conceptual framework highlighting the strategies for integrating sustainable development principles in PPP procurement process.	Content analysis through literature review has been adopted to identify the shortfalls in PPP process and examine the possible strategies to overcome the shortfalls from best practices in implementation of PPP projects. The preliminary framework of strategies has been conceptualized to integrate sustainable development principles in PPP procurement process. Finally, the feasibility of preliminary framework has been undertaken through focussed interviews with local stakeholders of PPPs.	The study indicates opportunities to promote sustainable development in the current PPP procurement process exists through enhancement in critical aspects like stakeholder's participation, environment impact assessment, value for money analysis, user's charges, risk allocation policies, transaction and bidding cost, and bid evaluation criteria.
12.	Naim Ahmad , Rashid Mehmood	"Enterprise systems: are we ready for future sustainable cities"	2015	This paper aims to revisit the adoption reasons of enterprise	The authors study the benefits of ES as perceived by large and small	The adoption of ES will bring benefits in all the dimensions of

		Supply Chain Management ISSN: 1359-8546		systems (ES) and supply chain management systems (SCMS) and to explore the new dimensions of sustainability required to be added in the whole process of adoption of these systems. Moreover, it aims to explore the benefits of ES to organizations and to relate these benefits to the ES adoption in future sustainable city settings.	and medium enterprise (SME) organizations using 100 case studies and discuss how these benefits can be realized for smart cities by projecting the ES benefits onto the proposed framework. The benefits are estimated with the Shang and Seddon's (2002) framework.	triple bottom line in addition to the firm's performance. ES will have pivotal role in future smart city settings and will be able to offer social, environmental and economic sustainability in addition to traditional organizational performance indicators.
13.	Mohammad Shamsuddoha	"Integrated Supply Chain Model for Sustainable Manufacturing: A System Dynamics Approach" Sustaining Competitive Advantage Via Business Intelligence, Knowledge Management, and System Dynamics ISBN: 978-1-78560-707-3, eISBN: 978-1-78560-706-6 ISSN: 1069-0964	2015	The specific purpose of this study is to develop an integrated supply chain model to design a sustainable poultry production process. Simultaneously, forward and reverse supply chains are examined in light of the economic, social and environmental benefits.	Study uses various process, methods and tools for conducting research. This current study also employed design science research (DSR) methodology, system dynamics (SD) and the case study approach with the support of computer simulations. These research approaches provide valuable feedback to one another	Research carried out to support the research questions that the real-life poultry supply chain could achieve sustainability if supply chain members follow the integrated simulation model. The findings from this study reveal that this research has made a valuable contribution to both theoretical and practical points of view.

						Specifically, the study has successfully integrated both the forward and reverse supply chains in order to achieve sustainable benefits.
14.	Praveen Goyal , Zillur Rahman , Absar Ahmad Kazmi	"Identification and prioritization of corporate sustainability practices using analytical hierarchy process" Journal of Modelling in Management ISSN: 1746-5664	2015	The purpose of this paper is to identify and prioritize the corporate sustainability practices to improve the corporate sustainability performance in the manufacturing sector. Further, these practices are being prioritized to find out the essential practices to ensure logical allocation of limited resources.	It examines the corporate sustainability practices which have been shortlisted from both the literature review and experts judgment. Then, analytic hierarchy process has been used to assess the identified 12 practices of corporate sustainability and to find their priorities for improvement of the corporate sustainability performance.	Based on the hierarchical model developed in this study, the analysis reveals market value, environment management and strategy, research and development, pollution prevention, corporate governance and investor responsibility, which have been found to be the most important practices in improving the corporate sustainability performance.
15.	Ravinder Kumar , Rajesh K. Singh , Ravi Shankar	"Strategy development by Indian SMEs for improving coordination in supply chain: An empirical study" Competitiveness Review ISSN: 1059-5422	2014	The purpose of this paper is to study the strategy development by small and medium enterprises (SMEs) for improving coordination in supply chain in Indian perspective.	For collecting data, a question-based survey was conducted. In total, 251 valid responses were received. Statistical analysis of data acquired from survey is done by one sample t-test, correlation and regression analysis.	Coordination strategies are positively correlated with business performances.
16.	Rajul Singh	"Modeling	2012	The purpose	This paper	The result

	,Roma Mitra Debnath	sustainable development : India's strategy for the future" World Journal of Science, Technology and Sustainable Development ISSN: 2042-5945		of this paper is to understand the relation among the various enablers of Clean Development Mechanism (CDM) to know their degree of dependence and driving power.	discusses a model to address the issues of sustainable development in the context of CDM. An interpretive structural model (ISM) has been used to model the various parameters of sustainable development in the Indian context.	shows that sustainable development is achievable if the nation emphasizes on strategic goals and mission because sustainable development is driven by the strategic parameters such as "employment creation" and "long-term economic goals".

2.1 GAPS OF THE STUDY

The majority of the studies conducted on Mathura Refinery are related to Pure Science and other aspects like management and Geology. Similar case is with Jamnagar Refinery. Studies have not considered any social and economic aspect. There is no such study which is related to SDG-9 so far, in which the contribution of these refineries is emphasized in promoting inclusive and sustainable Industrialization. The present study will consider SDG-9 i.e. Inclusive and Sustainable Industrialization which includes economic and social facets both, so that the progress towards the achievement would be analysed. This comparative study of public and private sector refineries will bring the concern in this area.

2.2 NEED OF THE STUDY

As the fastest growing major economy of the world, today, India is uniquely placed to deliver on its commitments to inclusive and sustainable development. Externally the country has played a key role in shaping the SDGs and ensuring the balance among its three pillars - economic, social and environmental. Taking cue from the memorable phrase Sabka Saath, Sabka Vikas, translated as "Collective Effort, Inclusive Development" and enunciated by the Prime Minister, stakeholders from various walks of life - central and state governments, industry, civil society, technical experts and academics - are coming together to promote a better future for the country. Economies thrive when an

industry is growing because a growth in the industry means more jobs, more money, and more opportunity. The standard of living increases when industry increases. The economic growth provided by industrial development is a well-sustained growth that can transform an economy. Industrial growth and economic growth go hand in hand.

Industrialisation plays a vital role in the development of the Indian economy. Like other goals, in SDG-9, the government has set some targets and has given its indicators so that we can know the performance of that industry. For analysing the progress it has made so far and knowing what parameters of SDG-9, industry is following; I have taken the Mathura Refinery of Petroleum Sector, apart **from being a big industry**, it caters to the demand of the North Western Region of the country. Jamnagar Refinery in India is the **World's largest oil refinery**, with 1.2 million barrels per day of output Capacity. I have taken Jamnagar Refinery for the comparative study with Mathura Refinery. As per the experts, the role of industrialization will be considered of utmost importance aftermath Covid crisis. Along with this, technology has emerged as more powerful and dominant in this era. Thus the scenario of industrialization and innovation in the economy will be focused in this study. This study will aim at comparing the role of selected private and public refineries towards SDG 2030 Agenda. This study will also find the gap between selected goals and present status along with providing some suggestions to bridge the gap.

2.3 RESEARCH PROBLEM

In the proposed study, the whole of research moves around the following questions:

1. Can Inclusive and Sustainable Industrialization be a key to rapid economic growth in post Covid -19 Era?
2. Does existing industrial policy of GOI tuned with SDG-9 Inclusive and Sustainable Industrialization?

3.0 OBJECTIVE OF THE STUDY

1. To understand the Rationale of Inclusive and Sustainable Industrialization in post Covid 19 Era.
2. To study the existing policies and programs of Government of India for Inclusive and Sustainable industrialisation in general and Petroleum industry in particulars.

3. To compare the Policies, procedures and Present position of both selected refineries in align with Inclusive and Sustainable Industrialization (Sustainable Development Goal-9).
4. To prepare an action plan to bridges up gaps for achieving the targets of SDG-9.

4.0 RESEARCH DESIGN AND METHODOLOGY

4.1 HYPOTHESES

$H_0$1: There is no significant relationship between **Sustainable infrastructure and its up gradation & retrofit industries** and **Sustainable Industrialisation.**

$H_0$2: There is no significant relationship between **clean & environment sound technologies** and **Sustainable Industrialisation.**

$H_0$3: There is no significant relationship between **Scientific Research** & **Technological up gradation** and **Sustainable Industrialisation.**

$H_0$4 There is no significant relationship between **development of Financial Services (Credit assistance) in the country a**nd **Inclusive & sustainable industrialisation**.

$H_0$5 There is no significant relationship between **development of MSMEs and Inclusive & sustainable industrialisation.**

$H_0$6 There is no significant relationship between **Inclusive & sustainable industrialisation** and **Employment Generation.**

$H_0$7 There is no significant relationship between **Inclusive & sustainable Industrialisation** and **human well-being.**

$H_0$8 There is no significant relationship between **Inclusive & sustainable Industrialisation** and GDP.

4.2 SCOPE OF THE STUDY

The present study will be undertaken to evaluate the role of Mathura Refinery and Jamnagar Refinery for Inclusive and Sustainable Industrialisation. The study will cover the policies and procedure which are followed by both. The main focus of the study will be to study the various targets of SDG-9 i.e. Inclusive and Sustainable Industrialisation through their indicators to know whether both the refineries are going in the right direction or not for achieving UN agenda of 2030.

DURATION OF THE STUDY

A study period will be from 2015 to 2022.

UNIVERSE

In the proposed study, Petroleum sector has been taken as universe. The oil and Gas industry has an oligopoly market structure. The details of the petrol stations owned by various companies in different states of India are given in Appendix 1.

SAMPLE UNITS

The study will be conducted on the basis of one refinery from the Public sector industry and one refinery from Private sector industry. Both the organizations are those which have maximum production capacity in their sector (Public and Private) in which one is Indian Oil Corporation Limited and second is Jamnagar Refinery (Reliance Petroleum Limited). Indian Oil Corporation Limited is the largest oil and gas company in India, also India's largest downstream oil company and most profitable state-owned company, followed by Oil and Natural Gas Corporation. Indian Oil controls 11 of India's 23 refineries. The group refining capacity is 80.7 million metric tonnes per annum (MMTPA) - the largest share among refining companies in India. It accounts for 32.36% share of national refining capacity. Jamnagar Refinery is the world's largest refining hub with refining capacity of 68.2 MMTPA. It accounts for 27.35% share of national refining capacity.

Thus the researcher has selected Mathura Refinery, IOCL and Jamnagar Refinery, RPL on the basis of their MMTPA. IOCL is a public company whereas RPL is a Private Player in petroleum industry.

4.3 SOURCE OF DATA

The proposed study will be analytical and descriptive in nature. Both the primary and secondary data will be used to justify the objectives of the study. The Secondary Data will be collected from the various Governments websites, books, Journals, magazines and internal office records of Mathura Refinery and Jamnagar Refinery.

Primary data will be used to verify and validate the results of secondary data. Data will be collected with the help of questionnaires and informal personal interviews of the Executives of Mathura Refinery and Jamnagar Refinery and officials of concerned Ministry. In addition to this beneficiaries

and employees of both the refineries will also be surveyed by structured questionnaire in sufficient numbers.

4.4 TOOL AND TECHNIQUES

For the purpose of analysis of data descriptive and inferential statistics will be used and various tools will be planned to adopt that test suit the objectives of the study. Correlation regression and chi square test will be applied to analyse the impacts of stated variables. The data collected from different sources will be classified and arranged in one or more forms according to the requirement.

VARIABLES OF THE STUDY

TARGETS	VARIABLES	COMPUTATION	SOURCES
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	9.2.1 Percentage Share of GVA in Manufacturing to Total GVA	The indicator is defined as the manufacturing Gross Value as percentage of Total Value Added (GVA) at current prices. a) Numerator: GVA at Basic Price in Manufacturing during reference year b) Denominator: GVA at basic prices during reference year c) Multiplier: 100 Gross Value Added is defined as output less intermediate consumption. Gross value added Is arrived by aggregating sector-wise value added. Sector-wise GVA is estimated using production/income/ expenditure approach depending upon the availability of related data	National Accounts Division, NSO, MoSPI
	9.2.2 Manufacturing employment as a proportion of total employment, 2017-18 (in percentage)	a) Numerator: Number of workers in manufacturing sector during the reference year b) Denominator: Number of workers during the reference year c) Multiplier: 100	Ministry of Statistics and Programme Implementation
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.	9.3.1 Share of household sector in total industry value added,(in percentage)	a) Numerator: GVA by Household during reference year b) Denominator: Total GVA during reference year c) Multiplier: 100 Gross Value Added is defined as output less intermediate consumption. Gross value added is arrived by aggregating sector-wise value added. Sector-wise	Ministry of Statistics and Programme Implementation

		GVA is estimated using production/income/ expenditure approach depending upon the availability of related data	
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO2 equivalent emission per unit of value added	CO2 emission per unit of value added = CO2 emission from manufacturing(in kg)/ Manufacturing value added	Ministry of Environment Forest and Climate Change (MoEF&CC)
	9.4.2 Energy use intensity of manufacturing value added, (Tone of Oil Equivalent /000' rupees)	The indicator is Energy Use Intensity in manufacturing sector a) Numerator: Total Primary Energy used in manufacturing sector during reference year b) Denominator: Economic output of the manufacturing sector in terms of GVA during reference year c) Multiplier:100	Economic Statistics Division, NSO, MoSPI
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	9.5.1 Percentage share of government spending on IPP (Research and Development) to total GDP, (in percentage)	Percentage share of government spending on intellectual properties product (IPP), which is considered as research and development at current price out of GDP at current price During the reference year. a) Numerator: Total expenditures on intellectual properties products during reference year b) Denominator: Gross Domestic Product, during the reference year c) Multiplier: Nil	National Accounts Division, NSO, MoSPI
	9.5.2 Researchers (in full time equivalent) per million population, 2015	This indicator is expressed in terms of researcher engaged in Research and Development (R & D) activities per million population & D activities comprise institutional sector, higher Education sector and industrial (public and private sector). a. Numerator: Number of researchers (in numbers)	Ministry of Science and Technology

		b. Denominator: Population during reference period (in million) c. Multiplier: Nil	
	9.5.3 Total number of patents issued (granted), in number (similar to Indicator 8.2.2 and 8.3.6)	The indicator is referred to total patents granted during the reference year. a) Numerator: Total number of patents granted during reference year b) Denominator: Nil c) Multiplier: Nil Patent: A patent is a form of intellectual property. It is an exclusive right granted for an Invention.	Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry
9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	9.b.1 Share of IPP in total Gross Fixed Capital Formation, (in percentage)	a) Numerator: Estimate of Intellectual Property Products in GFCF during reference year b) Denominator: Estimate of GFCF during reference year c) Multiplier: 100 Numerator is the net additions to fixed assets in the form of IPP in the economy during the Accounting period. IPP asset of GFCF is estimated using expenditure approach.	National Accounts Division, NSO, MoSPI
	9.b.3 Share of GVA of Information and Computer related activities in total GVA, (in percentage)	a) Numerator: GVA of Information and Computer related activities b) Denominator: GVA of the total economy c) Multiplier: 100	National Accounts Division, NSO, MoSPI

Source: Ministry of Statistics and Programme Implementation

RESEARCH METHODOLOGY

Objectives	**Methodology to be used**
To study the Rationale of Inclusive and Sustainable Industrialization in post Covid 19 Era.	For the fulfillment of First two objectives researcher will collect information from different government official websites.
To study the existing policies and programs of Government of India for Inclusive and Sustainable industrialisation in general and Petroleum industry in particulars.	

To compare the Policies, procedures and Present position of both selected refineries in align with Inclusive and Sustainable Industrialization (Sustainable Development Goal-9).	For achieving third objective Data will be collected from different official websites and Internal records of Mathura Refinery and Jamnagar Refinery. Data will also be collected through Questionnaires and Personal Interview of the Executives and Employees of both refineries for validation of the Secondary Data.
To prepare an action plan to bridge up these gaps	Action Plan will be based on the inferences and result extracted from the study.

CHAPTER PLAN

Chapter-1 Introduction

- Inclusive and Sustainable Industrialization
- Present Industrial Policy of Government of India
- Present Industrial Policy of Government of India for Petroleum Industry
- SDG-9

Chapter-2 Review of Literature, Research gap and Need of the study

Chapter-3 Research Design and Methodology

Chapter-4 Petroleum Industry in India - Past and Present

- History and Geography of Petroleum Industry
- Profile of IOCL and Mathura Refinery and Jamnagar Refinery
- Existing policies &Procedure and present status of Mathura Refinery (IOCL) and Jamnagar Refinery, RPL.

Chapter-5 Analysis and Testing of Hypothesis

Chapter-6 Results and Findings

Chapter-7 Action Plan, Suggestion and Conclusion

References and Bibliography

Annexures

References

1. Divya Tripathi, Pushpendra Priyadar shi, Pankaj Kumar and Sushil Kumar (2020) “Micro-foundations for sustainable development: leadership and employee performance” International Journal of Organizational Analysis, ISSN: 1934-8835, Volume 28, Issue1 PP.92-108.
2. Maitreyee Das, K. Rangarajan and Gautam Dutta (2020) “Corporate sustainability in SMEs: an Asian perspective” Journal of Asia Business Studies, ISSN: 1558-7894, Volume 14, Issue1 PP.109-138.
3. Luisa Huaccho Huatco and Peter D. Ball (2019) “The quest for achieving United Nations sustainability development goals (SDGs): Infrastructure and innovation for responsible production and consumption” RAUSP Management Journal, ISSN: 2531-0488, Volume 54, Issue3 PP.357-362.
4. Anuj Singla, Inderpreet Singh Ahuja and Amanpreet Singh Sethi (2019) “An examination of effectiveness of technology push strategies for achieving sustainable development in manufacturing industries” Journal of Science and Technology Policy Management, ISSN: 2053-4620, Volume 10, Issue1 PP.73-101.
5. Bebbington Jan and Unerman Jeffrey (2018) “Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research”Accounting, Auditing & Accountability Journal, ISSN: 0951-3574, Volume 31, Issue1 PP.2-24.
6. Anuj Singla, Inderpreet Singh Ahuja and APS Sethi (2018) “Technology push and demand pull practices for achieving sustainable development in manufacturing industries” Journal of Manufacturing Technology Management, ISSN: 1741-038X, Volume 29, Issue2 PP.240-272.
7. Surajit Bag, Shivam Gupta and Arnesh Telukdarie (2018) “Importance of innovation and flexibility in configuring supply network sustainability” Benchmarking: An International Journal, ISSN: 1463-5771, Volume 25, Issue9 PP.3951-3985.
8. Sumit Gupta, G.S. Dangayach, A.K. Singh and M.L. Meena, P.N. Rao (2018) “Implementation of sustainable manufacturing practices in Indian manufacturing companies” Benchmarking: An International Journal, ISSN: 1463-5771, Volume 25, Issue7 PP.2441-2459.
9. Shampy Kamboj and Zillur Rahman (2017) “Market orientation, marketing capabilities and

sustainable innovation: The mediating role of sustainable consumption and competitive advantage" Management Research Review, ISSN: 2040-8269, Volume 40, Issue6 PP.698-724.

10. Nilesh Agarchand and Boeing Laishram (2017) "Sustainable infrastructure development challenges through PPP procurement process: Indian perspective" International Journal of Managing Projects in Business, ISSN: 1753-8378, Volume 10, Issue3 PP.642-662.
11. Nilesh Agarchand Patil and Boeing Singh Laishram (2016) "Sustainability of Indian PPP procurement process: Development of strategies for enhancement" Built Environment Project and Asset Management, ISSN: 2044-124X, Volume 6, Issue5 PP.92-108.
12. Mohammad Shamsuddoha (2015) "Integrated Supply Chain Model for Sustainable Manufacturing: A System Dynamics Approach" Sustaining Competitive Advantage via Business Intelligence, Knowledge Management, and System Dynamics, ISSN: 1069-0964, Volume 22b, PP.155-399.
13. Praveen Goyal, Zillur Rahman and Absar Ahmad Kazmi (2015) "Identification and prioritization of corporate sustainability practices using analytical hierarchy process" Journal of Modelling in Management, ISSN: 1746-5664, Volume 10, Issue1 PP.23-49.
14. Naim Ahmad and Rashid Mehmood (2015) "Enterprise systems: are we ready for future sustainable cities" Supply Chain Management, ISSN: 1359-8546, Volume 20, Issue3 PP.264-283.
15. Ravinder Kumar, Rajesh K. Singh and Ravi Shankar (2014) "Strategy development by Indian SMEs for improving coordination in supply chain: An empirical study" Competitiveness Review, ISSN: 1059-5422, Volume 24, Issue5 PP.414-432.
16. Rajul Singh and Roma Mitra Debnath (2012) "Modeling sustainable development: India's strategy for the future" World Journal of Science, Technology and Sustainable Development, ISSN: 2042-5945, Volume 9, Issue2 PP.120-135.

WEBSITES

1. www.parivesh.nic.in
2. www.mospi.gov.in
3. www.finmin.nic.in
6. www.dipp.gov.in
7. www.dst.gov.in
8. www.dot.gov.in

4. www.niti.gov.in 9.www.msme.gov.in
5. www.sdg-tracker.org 10.www.undp.org

REPORTS

1. National Indicator Framework Report

APPENDIX 1

Petrol Stations Owned By Various Companies

Oil Company/State/UT	**IOCL**	**HPCL**	**BPCL**	**Others RIL/Essar Oil/Shell/ONGC**	**Total**
Andhra Pradesh	1199	929	720	210	3050
Arunachal Pradesh	48	0	7	16	71
Assam	503	91	129	65	788
Bihar	1351	475	610	75	2511
Chhattisgarh	481	329	275	23	1108
Delhi	189	97	107	0	393
Goa	31	36	47	0	114
Gujarat	1274	738	771	601	3384
Haryana	1334	666	385	151	2536
Himachal Pradesh	218	109	62	7	396
Jammu & Kashmir	221	130	134	0	485
Jharkhand	496	265	319	71	1151
Karnataka	1803	888	966	179	3836
Kerala	885	587	457	80	2009
Madhya Pradesh	1295	814	917	243	3269
Maharashtra	1846	1542	1678	353	5419
Manipur	69	0	12	4	85
Meghalaya	116	23	39	12	190
Mizoram	30	3	2	1	36
Nagaland	45	3	9	12	69
Odisha	748	314	414	84	1560
Punjab	1685	878	610	143	3316
Rajasthan	1630	977	819	310	3736
Sikkim	16	7	23	1	47
Tamil Nadu	1991	1158	1317	236	4702
Telangana	911	644	565	108	2228
Tripura	62	0	2	3	67
Uttar Pradesh	**3394**	**1374**	**1313**	**535**	**6616**
Uttarakhand	242	166	114	29	551
West Bengal	1119	488	563	74	2244
Andaman & Nicobar	10	0	0	0	10
Chandigarh	20	11	10	0	41
Dadra & Nagar Haveli	11	11	4	5	31
Daman & Diu	11	10	7	3	31
Lakshadweep	0	0	0	0	0
Puducherry	79	39	32	6	156
Grand Total	25363	13802	13439	3586	56190
SOURCE: Ministry of Petroleum					